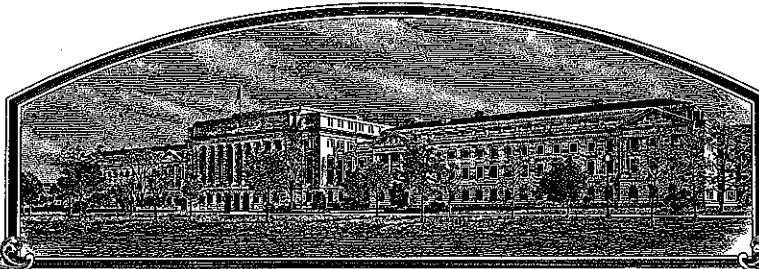


No.



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Montana Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE SAID PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Hyalite'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this eleventh day of December, in the year two thousand and six.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

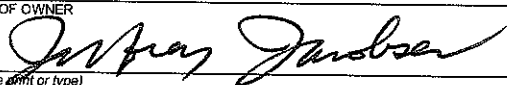


U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Montana Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME MTCL0306		3. VARIETY NAME Hyalite	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 202 Linfield Hall; Montana State University Bozeman, MT 59717		5. TELEPHONE (include area code) 406-994-3681		FOR OFFICIAL USE ONLY PVPO NUMBER 200600291 FILING DATE SEPTEMBER 18, 2006	
		6. FAX (include area code) 406-994-6579			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) State Experiment Station		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Philip L. Bruckner Dep. of Plant Sciences & Plant Pathology; Montana State Univ. Bozeman, MT 59717				FILING AND EXAMINATION FEES: \$ 4,382.00 DATE 9/18/06 CERTIFICATION FEE: \$ 768.00 DATE 11-29-2006	
11. TELEPHONE (include area code) 406-994-5127		12. FAX (include area code) 406-994-1848		13. E-MAIL bruckner@montana.edu	
14. CROP KIND (Common Name) Wheat, common		16. FAMILY NAME (Botanical) Triticeae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Triticum aestivum		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input checked="" type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23)	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Exhibit F. Declaration Regarding Deposit g. <input checked="" type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) h. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)			
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER 		SIGNATURE OF OWNER			
NAME (Please print or type) Jeffrey Jacobsen		NAME (Please print or type)			
CAPACITY OR TITLE Dean & Director, COA/AES		DATE 9/6/06		CAPACITY OR TITLE DATE	

(See reverse for instructions and information collection burden statement)

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety or by direct deposit soon after filing, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

Plant Variety Protection Office
Telephone: (301) 504-5518 **FAX:** (301) 504-5291
General E-mail: PVP@mail@usda.gov
Homepage: <http://www.ams.usda.gov/science/pvpo/PVPIndex.htm>

SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and **provide evidence** that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870.
<http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 (2) the details of subsequent stages of selection and multiplication;
 (3) evidence of uniformity and stability; and
 (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
 (1) identify these varieties and state all differences objectively;
 (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

U.S. - September 15, 2005

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

US Patent 5,369,022. Filed Sept. 17, 1993. Issued Nov. 29, 1994. Assignee: BASF Agrochemical Products

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Exhibit A - revised**Origin & Breeding History of HYALITE**

'Hyalite', a Clearfield® hard white winter wheat (*Triticum aestivum* L.) with tolerance to imazamox herbicide was developed by the Montana Agricultural Experiment Station and exclusively licensed to Westbred, LLC in September 2005. Hyalite was selected as an F₃-derived F₄ headrow from the composite cross, 98X78c, a composite of F₂ seed of three related populations, 98X78 (MTW9727/FS2//NuWest), 98X88 (MTW9722/3//NuWest//TAM 110'S*4/FS2), and 98X93 (NuSky//TAM 110*4/FS2/3/3/N95S004). The wheat germplasm line FS2 was developed by BASF Corporation (formerly American Cyanamid) using sodium azide induced mutagenesis of the French wheat cultivar 'Fidel' to obtain tolerance to the imidazolinone class of herbicides. NuSky, NuWest, MTW9722 (Redwin/Rio Blanco//NuWest), and MTW9727 (Norwin//Froid/SD1287/3//NuWest) are adapted, high quality hard white winter wheat lines developed at Montana State University. N95S004 (KS87809-10/Arapahoe) is an unreleased experimental line developed by the USDA ARS program in Nebraska.

The F₁ populations were grown in the greenhouse in 1998 and sprayed with imazamox (=Beyond) herbicide to remove susceptible topcross segregants. A composite of F₂ seed of the three related populations was made and planted as an F₂ bulk population (98X78c) at Kalispell in 1999 and subsequently as an F₃ bulk population at Kalispell in 2000. F₂ and F₃ bulk populations were sprayed with Beyond to remove herbicide-susceptible segregants. Resistant F₂ plants were selected and bulked to generate the F₃ population and 100 individual heads from herbicide-resistant F₃ plants were selected from the population at harvest maturity. F₃-derived F₄ headrows were grown at Fort Ellis in 2001 and sprayed with Beyond at a 2X rate. Herbicide-tolerant headrow 98X78cC86 was selected based on visual criteria for herbicide tolerance, uniformity, productivity, and acceptable agronomic type and harvested in bulk. 98X78cC86 was subsequently tested in sprayed (2X) and non-sprayed segments of the 2002 Single Rep Clearfield Observation Nursery grown at Bozeman, Havre, and Moccasin, MT. In 2003, 98X78cC86 was designated MTCL0306 and tested in the Preliminary Clearfield screening nursery at six sites (2 sprayed, 4 non-sprayed). In 2004, MTCL0306 was planted in the Clearfield qualification trial (0X, 1X, 2X rates) at four locations (3 loc-harvested) and in the non-sprayed Montana Advanced nursery at six locations. Hyalite has been tested in the multi-location Montana Intrastate trial since 2005. Quality has been evaluated in multi-location Montana trials since 2003.

Breeder seed of Hyalite was developed in 2004 and 2005. Seed purification of Hyalite was initiated in 2004 when F₃-derived F₆ seed was used to plant a single isolated strip increase plot of each line in Yuma, AZ. The strip increase plot was sprayed with Beyond herbicide (1X rate), harvested individually with a Wintersteiger combine, and shipped to Bozeman in bulk bags (about 500 lbs of seed). No rouging or close observation of these lines was done in Yuma. Seed was cleaned and treated by the MAES Foundation Seed program in Bozeman and planted on 2.5 acres at Kalispell, MT in 2005 as breeder seed (F_{3.8}). The increase was rogued to remove phenotypic variants.

200600291

Hyalite is an F₃ derived line. The cultivar has been shown to be true-breeding across multiple generations and environments. Hyalite has been observed to be stable and uniform across multiple locations from 2002 to 2006 (five generations). Hyalite contains a dark-chaffed variant at a frequency of <5 per 10,000 plants, a tall, white-chaffed variant at a frequency of <2 per 10,000 plants, and red kernel variants at a frequency of <16 per 10,000 kernels.

Foundation seed of Hyalite will be maintained by the Montana Agricultural Experiment Station, Montana State University, Bozeman, MT 59717.

Exhibit B
Statement of Distinctness

Hyalite is an imidazolinone-tolerant hard white winter wheat cultivar most similar to 'NuSky', a hard white winter wheat cultivar developed and released by Montana State University in 2001. Both Hyalite and NuSky are conventional height hard white winter wheat cultivars with white chaff, seed containing relatively low levels of polyphenol oxidase, and similar end-use qualities. However, Hyalite and NuSky are distinctly different for reaction to 'Beyond' herbicide and in date of heading. Hyalite contains the *Als1* gene which confers tolerance to the herbicide 'Beyond' (imidazolinone class) whereas NuSky does not have the *Als1* gene and is susceptible to the herbicide 'Beyond'. Hyalite is significantly earlier in heading than NuSky. Hyalite headed an average of 4.1 days (range 2.6 to 5.9 days) earlier than NuSky at seven 2005 Montana performance testing locations (Table B1).

Table B1. Heading dates of Hyalite and NuSky winter wheat cultivars in replicated yield trials at seven Montana locations in 2005.

Location	Hyalite	NuSky	LSD 0.05
	----- Days from January 1 -----		
Bozeman	169.4	172.9	0.8
Havre	162.0	166.5	2.5
Sidney	159.2	161.8	1.5
Williston	154.4	158.5	1.6
Kalispell	153.0	157.7	2.0
Moccasin	170.3	173.7	1.1
Huntley	154.7	160.6	1.0
Mean	160.4	164.5	---

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Wheat (*Triticum* spp.)

NAME OF APPLICANT (S) Montana Agricultural Experiment Station	TEMPORARY OR EXPERIMENTAL DESIGNATION MTCL0306	VARIETY NAME Hyalite
ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) 202 Linfield Hall Montana State University Bozeman, MT 59717		FOR OFFICIAL USE ONLY PVPO NUMBER 200600291

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g., or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____ Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

- 1 = Common
2 = Durum
3 = Club
4 = Other (Specify) _____

2. VERNALIZATION:

- 1 = Spring
2 = Winter
3 = Other (Specify) _____

3. COLEOPTILE ANTHOCYANIN:

- 1 = Absent
2 = Present

4. JUVENILE PLANT GROWTH:

- 1 = Prostrate
2 = Semi-Erect
3 = Erect

5. PLANT COLOR: (boot stage)

- 1 = Yellow-Green
2 = Green
3 = Blue-Green

6. FLAG LEAF: (boot stage)

- 1 = Erect
2 = Recurved

- 1 = Not Twisted
2 = Twisted

- 1 = Wax Absent
2 = Wax Present

7. EAR EMERGENCE:

Number of Days (Average)

Number of Days Earlier Than

Same As

Number of Days Later Than

* **BigSky, Genou, Rampart**
* **Rocky**
* **Above**

*Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

8. ANTHOR COLOR:

- 1 = Yellow
2 = Purple

9. PLANT HEIGHT: (from soil to top of head, excluding awns)

092

cm (Average)

10

cm Taller Than

CDC Falcon, Pryor

Same As

09

cm Shorter Than

BigSky, Rocky

10. STEM:

A. ANTHOCYANIN

1

1 = Absent 2 = Present

B. WAXY BLOOM

1

1 = Absent 2 = Present

C. HAIRINESS (last internode of rachis)

2

1 = Absent 2 = Present

D. INTERNODE

1

1 = Hollow 2 = Semi-Solid 3 = Solid

4

Number of Nodes

E. PEDUNCLE

1

1 = Erect 2 = Recurved 3 = Semi-Erect

24

cm Length

F. AURICLE

1

Anthocyanin: 1 = Absent 2 = Present

1

Hair: 1 = Absent 2 = Present

11. HEAD: (At Maturity)

A. DENSITY

2

1 = Lax
2 = Middense (Laxidense)
3 = Dense

B. SHAPE

1

1 = Tapering
2 = Strap
3 = Clavate
4 = Other (Specify)

C. CURVATURE

1

1 = Erect
2 = Inclined
3 = Recurved

D. AWNEDNESS

4

1 = Awnless
2 = Apically Awnletted
3 = Awnletted
4 = Awned

12. GLUMES: (At Maturity)

A. COLOR

1

1 = White
2 = Tan
3 = Other (Specify)

B. SHOULDER

1

1 = Wanting 2 = Oblique
3 = Rounded 4 = Square
5 = Elevated 6 = Apiculate
7 = Other (Specify)

C. SHOULDER WIDTH

1

1 = Narrow
2 = Medium
3 = Wide

D. BEAK

3

1 = Obtuse
2 = Acute
3 = Acuminate

E. BEAK WIDTH

1

1 = Narrow
2 = Medium
3 = Wide

F. GLUME LENGTH

3

1 = Short (ca. 7 mm)
2 = Medium (ca. 8 mm)
3 = Long (ca. 9 mm)

G. WIDTH

1

1 = Narrow (ca. 3 mm)
2 = Medium (ca. 3.5 mm)
3 = Wide (ca. 4 mm)

H. PUBESCENCE

1 = Not Present
2 = Present

13. SEED:

A. SHAPE

- ☒ 1 = Ovate
☐ 2 = Oval
☐ 3 = Elliptical

B. CHEEK

- ☒ 1 = Rounded
☐ 2 = Angular

C. BRUSH

- ☒ 2 1 = Short
☐ 1 2 = Medium
☐ 3 = Long
☐ 1 1 = Not Collared
☐ 2 = Collared

D. CREASE

- ☒ 1 1 = Width 60% or less of Kernel
☐ 2 = Width 80% or less of Kernel
☐ 3 = Width Nearly as Wide as Kernel

- ☒ 1 1 = Depth 20% or less of Kernel
☐ 2 = Depth 35% or less of Kernel
☐ 3 = Depth 50% or less of Kernel

E. COLOR

- ☒ 1 = White
☐ 2 = Amber
☐ 3 = Red
☐ 4 = Other (Specify) _____

F. TEXTURE

- ☒ 1 = Hard
☐ 2 = Soft
☐ 3 = Other (Specify) _____

G. PHENOL REACTION (See Instructions)

- ☒ 0 1 = Ivory
☐ 2 = Fawn
☐ 3 = Light Brown
☐ 4 = Dark Brown
☐ 5 = Black

Not evaluated

H. SEED WEIGHT

- ☒ 34 g/1000 Seed (whole number only)

I. GERM SIZE

- ☒ 3 1 = Small
☐ 2 = Midsize
☐ 3 = Large

14. DISEASE: PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

(0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

- | | |
|--|--|
| <input checked="" type="checkbox"/> 2 Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>) | <input checked="" type="checkbox"/> 0 Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>) |
| <input checked="" type="checkbox"/> 1 Stripe Rust (<i>Puccinia striiformis</i>) | <input checked="" type="checkbox"/> 0 Loose Smut (<i>Ustilago tritici</i>) |
| <input checked="" type="checkbox"/> 0 Tan Spot (<i>Pyrenophora tritici-repentis</i>) | <input checked="" type="checkbox"/> 0 Flag Smut (<i>Urocystis agropyri</i>) |
| <input checked="" type="checkbox"/> 0 Halo Spot (<i>Selenophoma donacis</i>) | <input checked="" type="checkbox"/> 0 Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) |
| <input checked="" type="checkbox"/> 0 <i>Septoria nodorum</i> (Glume Blotch) | <input checked="" type="checkbox"/> 0 Dwarf Bunt (<i>Tilletia controversa</i>) |
| <input checked="" type="checkbox"/> 0 <i>Septoria avenae</i> (Speckled Leaf Disease) | <input checked="" type="checkbox"/> 0 Karnal Bunt (<i>Tilletia indica</i>) |
| <input checked="" type="checkbox"/> 0 <i>Septoria tritici</i> (Speckled Leaf Blotch) | <input checked="" type="checkbox"/> 0 Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>) |
| <input checked="" type="checkbox"/> 0 Scab (<i>Fusarium</i> spp.) | <input checked="" type="checkbox"/> 0 "Snow Molds" |
| <input checked="" type="checkbox"/> 0 "Black Point" (Kernel Smudge) | <input checked="" type="checkbox"/> 0 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input checked="" type="checkbox"/> 0 Barley Yellow Dwarf Virus (BYDV) | <input checked="" type="checkbox"/> 0 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input checked="" type="checkbox"/> 0 Soilborne Mosaic Virus (SBMV) | <input checked="" type="checkbox"/> 0 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input checked="" type="checkbox"/> 0 Wheat Yellow (Spindle Streak) Mosaic Virus | <input checked="" type="checkbox"/> 0 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input checked="" type="checkbox"/> 0 Wheat Streak Mosaic Virus (WSMV) | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |

15. INSECT: (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

- | | |
|---|--|
| <input checked="" type="checkbox"/> 0 Hessian Fly (<i>Mayetiola destructor</i>) | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> 1 Stem Sawfly (<i>Cephus</i> spp.) | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> 0 Cereal Leaf Beetle (<i>Oulema melanopa</i>) | <input type="checkbox"/> Other (Specify) _____ |

15. INSECT: (continued) (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

PLEASE SPECIFY BIOTYPE (Where Needed)

☒

Russian Aphid (*Diuraphis noxia*)

☐

Other (Specify) _____

☒

Greenbug (*Schizaphis graminum*)

☐

Other (Specify) _____

☒

Aphids

☐

Other (Specify) _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

Hyalite is tolerant to the herbicide 'Beyond' (imidazolinone class).

WHEAT DESCRIPTOR ILLUSTRATIONS

Section Numbers Correspond to the Numbers of the Sections on the Form



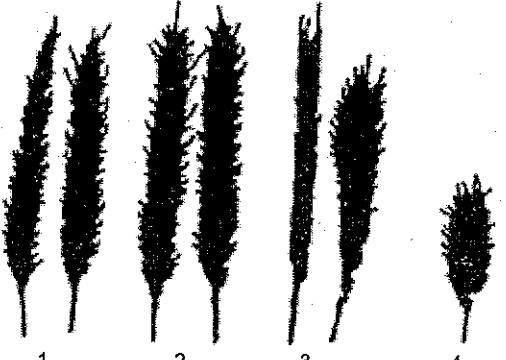

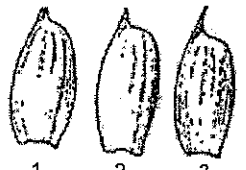
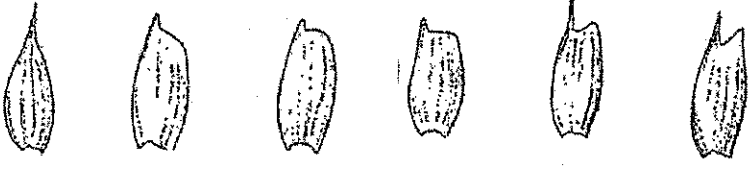

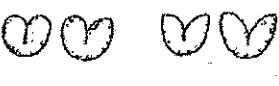
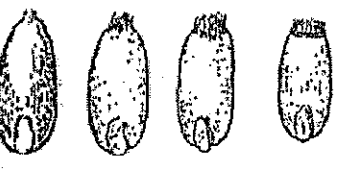
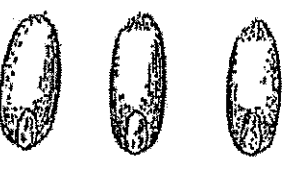



<p>4. EARLY PLANT GROWTH HABIT:</p>  <p>1 Prostrate 2 Intermediate 3 Erect</p>	<p>10. (D.) STEM INTERNODE X-SECTION:</p>  <p>1 Hollow 2 Semi-solid 3 Solid</p>	<p>11. (B.) SPIKE SHAPE:</p>  <p>1 Tapering 2 Oblong 3 Clavate 4 Elliptical</p>	
<p>11. (D.) AWNEDNESS:</p>  <p>1 Awnless 2 Apically Awnleted 3 Awnleted 4 Awned</p>	<p>12. (D.) BEAK SHAPE:</p>  <p>1 Obtuse 2 Acute 3 Acuminate</p>		
<p>12. (C.) SHOULDER SHAPE:</p>  <p>1 Wanting 2 Oblique 3 Rounded 4 Square 5 Elevated 6 Apiculate</p>			
<p>13. (A.) SEED SHAPE:</p>  <p>1 Ovate 2 Oval 3 Elliptical</p>	<p>13. (B.) CHEEK SHAPE:</p>  <p>1 Rounded 2 Angular</p>	<p>13. (C.) BRUSH SIZE</p>  <p>1 Small 2 Midsized 3 Large 4 Collared</p>	<p>13. (C.) BRUSH HAIR LENGTH:</p>  <p>1 Short 2 Medium 3 Long</p>
<p>13. (I.) GERM (EMBRYO) SIZE:</p>  <p>1 Small 2 Midsized 3 Large</p>	<p>13. (D.) SEED CREASE WIDTH:</p>  <p>1 Narrow 2 Mid-wide 3 Wide</p>	<p>13. (D.) SEED CREASE DEPTH:</p>  <p>1 Shallow 2 Mid-Deep 3 Deep</p>	

Exhibit D**Additional Description of Hyalite Wheat**

Hyalite is a low PPO (polyphenol oxidase) hard white winter Clearfield line with a dual-purpose (acceptable bread quality + acceptable Asian noodle quality) qualities similar to NuWest and NuSky. Hyalite is equivalent in yield to Neeley under Montana growing conditions. The cultivar has good adaptation and crop tolerance to herbicide. Hyalite is a medium maturity, conventional-height wheat. Heading date of Hyalite is approximately four days earlier than Tiber and Neeley under Montana conditions. Mean grain yield and agronomic characteristics of Norris in trials conducted from 2003 to 2005 is shown in Table D1. Mean milling and baking data for Norris and check cultivars from 2003 and 2004 is shown in Table D2.

Supplement to Exhibit D

Table D1. Mean grain yield and agronomic characteristics of Hyalite and check cultivars in multiple Montana field trials from 2003 to 2005. Winter survival data collected only in environments with differential expression of the trait.

Mean grain yield and agronomic characteristics of Norris and Bynum and elite check cultivars in 2003-2005 (37 location-years).

vs. Elite Checks

	Grain yield	Test weight	Winter survival	Heading date	Plant height	Grain protein	Stem solidness
	bu/a	lb/bu	%	Julian	in.	%	5-25 scale
Neeley	57.9	58.6	58.3	165.8	35.0	13.7	6.0
Hyalite	57.4	59.8	63.3	161.2	34.1	13.8	
Norris	60.1	60.3	61.7	160.3	34.9	13.1	
Bynum	52.5	60.3	52.9	161.6	34.2	14.5	17.8
Rampart	53.4	59.6	53.6	163.6	34.7	14.3	19.8
LSD 5%	3.3	0.7	ns	0.8	0.6	0.3	2.0
CV (%)	12.6	2.7	13.3	0.8	3.7	4.9	11.8
# env.	37	37	5	21	36	37	7

Table D2. Mean milling and baking characteristics of Hyalite and check cultivars in multiple Montana field trials from 2003 to 2004.

vs. Elite Checks

Line	Flour yield	Flour protein	Flour ash	Mixograph tolerance	Bake mix time	Bake absorptior	Loaf volume	Crumb grain
	%	%	%		min	%	cc	
Rampart	67.2	13.0	0.38	4.1	7.6	72.7	1114	3.5
Bynum	69.5	13.2	0.37	3.4	6.7	72.1	1094	3.5
Norris	67.6	11.8	0.36	4.9	7.7	71.1	1061	3.3
Neeley	65.9	12.2	0.38	5.0	7.4	71.1	1055	3.5
Hyalite	67.4	12.5	0.36	4.6	6.5	71.7	1051	3.3
LSD 5%	1.5	0.6	0.02	0.9	ns	ns	44	ns
CV %	2.4	5.2	4.7	21.0	18.2	2.6	4.3	16.7
# envir.	9	9	9	9	9	9	9	6

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Montana Agricultural Experiment Station	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER MTCL0306	3. VARIETY NAME Hyalite
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) 202 Linfield Hall Montana State University Bozeman, MT 59717	5. TELEPHONE (Include area code) (406) 994-3681	6. FAX (Include area code) (406) 994-6579
7. PVPO NUMBER		200600291

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.



YES



NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country.



YES



NO

10. Is the applicant the original owner?



YES



NO

If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?



YES



NO

If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?



YES



NO

If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved OMB NO 0581-0055

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT F
DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S) Montana Agricultural Experiment Station	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 202 Linfield Hall Montana State University Bozeman, MT 59717	TEMPORARY OR EXPERIMENTAL DESIGNATION MTCL0306
NAME OF OWNER REPRESENTATIVE (S) Phil L. Bruckner	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 202 Linfield Hall Montana State University Bozeman, MT 59717	VARIETY NAME Hyalite
		FOR OFFICIAL USE ONLY
		PVPO NUMBER 200600291

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Signature 

Date 9/6/06